Maternal Emotion and Depressive Symptoms in Relation to Child Outcomes: A Person-Centered Approach

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The manner in which children learn to express and regulate their emotions is considered to occur within a social context, and the influence of parents in this process is especially significant (for review see Eisenberg, Cumberland, Spinard, 1998). Of particular concern is the mother's role in socializing emotions, as she is commonly considered to be a key contributor to this process (e.g. Morris, Silk, Steinberg, Myers, & Robinson, 2007). Furthermore, the effective development and socialization of emotion in early childhood, particularly adaptive abilities to regulate one's emotions and behavior, has been linked to many child outcomes, including social competence (Eisenberg, Fabes, Gunthrie, & Reiser, 2000; Eisenberg, Gershoff, et al., 2001) and problem behaviors (Denham et al, 2000; Rydell, Berlin, Bohlin, 2003). However, maternal characteristics and behaviors that differentially influence children's emotional development are generally considered independently, and the interconnected nature of these influences is not fully understood. With the aim of better understanding the variability and complexities of the maternal role in the emotional development of children, the current study proposes to investigate differing maternal profiles in relation to child emotion regulation and problem behaviors.

Emotional Development

Children develop adaptive emotion regulatory skills through the socialization they receive from their parents. Eisenberg, Losoya, and colleagues (2001) described emotion socialization as including the "parental practices and behaviors that influence a child's learning

regarding the experience, expression, and regulation of emotion and emotion-related behavior" (pp. 183). Emotion regulation involves the internal and external processes that monitor, initiate, and inhibit conditionally appropriate emotional responses and expressions (Eisenberg et al., 2000). In a review of emotion regulation development in the context of the family, Morris and colleagues (2007) proposed a model in which parental influence occurs through observation (e.g. modeling), parenting practices (e.g. reactions to emotions), and the emotional climate of the family (e.g. emotionality). Applying this framework, in the current study, we consider the child's situational expression of affect in the presence of the mother, maternal characteristics that have been shown influence emotional parenting practices, and broader maternal familial emotionality.

When considering the maternal influences on child emotional development, both general maternal emotionality (e.g. Eisenberg et al., 2000) and emotional exchanges between mothers and children (e.g. Kochanska & Askan, 2004) are of particular concern. Emotionality is a trait that remains stable across time and differing situations (e.g. Eisenberg et al., 2000). In general, positive maternal emotionality is associated with adaptive child outcomes (Cumberland-Li, Eisenberg, Champion, Gershoff, & Fabes, 2003); for example, the toddlers of mothers who report higher levels of family positive affect expression have been found to use more effective strategies to regulate emotions (Garner, 1995). In contrast, negative emotionality within the family is generally associated with poorer child outcomes (Eisenberg, Gershoff, et al., 2001); however, this relationship is less consistent (Halberstadt & Eaton, 2002).

With regard to direct emotional exchanges between mothers and young children, mutual positive affect expression has been found to be an important component of healthy parent-child interactions and child adjustment (Chaplin, Cole, and Zahn-Waxler, 2005). In a review considering dyadic synchrony across early childhood, Harrist and Waugh (2002) explained that

positive affect matching between mother and child promotes the development of adaptive child affect expression and emotion regulation, especially in early childhood when children begin to gain competence in regulating their emotions. Through these mother-child interactions and exchanges, children develop adaptive emotion regulation abilities (Diamond & Aspinwall, 2003).

Overall, these findings suggest that mothers play an integral role in the process by which children are socialized to express affect and regulate emotions. This role is especially significant in early childhood as children are beginning to develop and employ emotion regulation skills, but often still rely on external regulation support (e.g. Morris et al., 2007). Because adaptive child emotional development is so important for later child outcomes, it is important to understand the maternal influences in this process. In considering the maternal influence, it is essential to investigate what individual maternal factors and characteristics influence how mothers socialize their children emotionally. The current study primarily focuses on two maternal characteristics, depressive symptoms and stress, which are commonly associated with levels and types of emotion expression (Feng et al., 2008; Lazarus, 2006).

Maternal Depression

In general, children of depressed mothers are at a greater risk to experience adverse outcomes, including poor social adjustment, academic difficulties, and internalizing and externalizing problems (Goodman, 2007; Silk, Shaw, Skuban, Oland, & Kovacs, 2006). Exposure to mothers' negative or maladaptive affect expression has been identified as one of the risk mechanisms that may lead to adverse outcomes in children of depressed mothers (Goodman, 2007; Goodman & Gotlib, 1999). These mothers are likely to have difficulties regulating their own emotions (Silk, Shaw, Forbes et al., 2006) and experience greater challenges supporting

their children's development. Depressed mothers display more sad and irritable affect (Cohn, Campbell, Matias, & Hopkins, 1990), as well as show less positive affect to their children and are less likely to respond to children's distress (Feng et al., 2008) than nondepressed mothers. Consequently, emotion expression and regulation in children of depressed mothers tends to be less adaptive and effective compared to their peers (Silk, Shaw, Skuban et al., 2006).

Maternal Stress

Similar to depression, stress is related to emotion experience and expression (Zautra, 2003). The association between stress and emotion extends mother-child interactions, as greater stress has been found to be related to lower maternal positive affect expression and less dyadic pleasure expressed by mother and child, as well as later increased rates of child behavior problems (Crnic, Gaze, & Hoffman, 2005). Parenting stress also generalizes to other areas of child , as higher rates of parenting stress are associated with both poorer parenting behavior and child outcomes (Feldman, Eidelman, Rotenberg, 2004). More specifically, parenting stress is related to less nurturing parent behavior and less social competence and greater levels of internalizing and externalizing behavior in children (Anthony et al, 2005). These findings highlight the importance of considering the co-occurrence of maternal characteristics that are associated with emotion expression and influence child emotion regulation and behavioral outcomes.

Defining Maternal Profiles

The research concerning maternal emotion expression, depression, and stress, as they are related to child adaptive emotion regulation and problem behaviors presents a complicated and interconnected picture. It is possible that various maternal characteristics interact to differentially influence the emotion socialization process. For instance, Weinberg and Trolnick (1998)

suggested that, though many depressed mothers tend to behave and express affect similarly, when the literature is considered comprehensively depressed mothers do not represent a homogeneous group. In interactions between depressed mothers' and their infants, distinct patterns emerge characterized by intrusiveness or disengaged withdrawal, with a smaller group of these mothers having a "good" interaction style (Field, Hernandez-Reif, & Diego, 2006).

Thus, the current study proposes to take a person-centered approach to the investigation of differing maternal profiles in relation to child emotion regulation and problem behaviors. A person-centered method, as opposed to a variable-centered approach, addresses within-group variance by focusing on levels of co-occurring and inter-dependent characteristics within like individuals, and it allows for the organization of meaningful traits within an individual as they interact to influence outcomes (Henry, Tolan, & Gorman-Smith, 2005; Von Eye & Bergman, 2003). With regard to emotional development, recent studies have begun to employ a person-centered approach when investigating the relationships between emotion and child outcomes.

When applying a person-centered approach to the study of maternal emotionality as it influences child outcomes, Nelson and colleagues (2012) identified three differing expressive styles characterized by (1) high levels of positivity and low levels of negativity, (2) very low positivity with average negativity, and (3) average positivity with very high negativity. Further, the authors found that maternal expressive style was related to both current child emotion expression (positive and negative) and emotion expression and emotion regulation one year later. In a similar study considering maternal well-being and the family emotional climate in low-income families from a person-centered perspective, Brophy-Herb et al. (2013) identified four distinct maternal profiles as they related to toddler outcomes. These profiles were labeled Competent, Distressed, Expressive, and Controlled, varying significantly on various maternal

characteristics. The maternal profiles were also found to be differentially related to child behavioral outcomes, including internalizing and externalizing behaviors.

Collectively, these findings suggest that the interaction patterns of mothers with their children vary based on the combination of several possible maternal characteristics. They also indicate that varying maternal profiles predict different child outcomes. Most significantly, however, is the finding that diverse maternal levels of emotionality, emotion expression, and depression can lead to both positive and negative child outcomes, and that no one characteristic is entirely sufficient when considering these influences.

The Current Study

This study investigates the relationships among maternal emotion expression, maternal characteristics, and child outcomes using a person-centered, clustering approach to identify differing maternal profiles. The preschool-age was selected, as it represents a time when children are still dependent on the parent for many of their needs, but are transitioning into school and away from complete dependence. Additionally, because certain demographic factors are associated with parental characteristics that influence emotion socialization, such as education (Eisenberg, Losoya, et al., 2001), the current study proposes to further investigate maternal groups based on demographic features.

Based on the previous research applying similar methods and considering related measures (Brophy-Herb et al., 2013; Nelson et al., 2012), we proposed three hypotheses. *Hypothesis 1:* There would be three to four maternal profiles identified with one profile defined primarily by positive emotion and low depressive symptoms and stress, another defined by negative emotion and high depressive symptoms and stress, and a third or fourth defined by a mix of these characteristics. *Hypothesis 2:* Maternal profiles characterized by high levels of

positive expression and/or emotionality would be associated with greater child positive expressions, whereas maternal profiles characterized by high levels of negative emotionality, stress and depressive symptoms would be associated with greater child negative expressions, as compared to other profiles. *Hypothesis 3:* Maternal profiles characterized by high levels of negative emotionality, stress and depressive symptoms would be associated with greater child internalizing and externalizing problems, as compared to the other profiles.

Methods

Participants

Data for this study was drawn from a larger, ongoing longitudinal project concerning maternal depression and child emotional development. Participants were recruited from the local community surrounding the Columbus, OH area. Mothers with young children were recruited though local newspapers, online ads, flyers sent to local daycare centers and mental health clinics, and flyers posted at community centers on or close to a university campus. A brief, phone screening questionnaire was used to determine eligibility and collect maternal history of depression information. Mothers met eligibility criteria if they 1) were 21 years of age or older; 2) had a child between 3 and 3.5 years; and 3) had not been diagnosed with psychiatric disorders other than depression (with or without co-occurring anxiety disorders). Children were excluded from participation if they had been diagnosed with a developmental delay.

The current study included 100 mother-child pairs, and the sample was fairly evenly divided between male (n = 52) and female (n = 48) children. On average, mothers were 31.55 years old (SD = 5.40) and children, 3.19 (SD = 0.18). At the time of the screening, mothers were also administered the Center for Epidemiological Studies Depression Scale (CES-D; Radloff, 1977). This contains 20 questions on a 4-point scale assessing how many days over the previous

week the mother had been experiencing various depressive symptoms. This scale was used to determine initial classification of the mothers into either the depressed or nondepressed groups based on its established clinical cutoff point (16+; Radloff, 1977). Within the current sample, 36 mothers had depressive symptoms above this cutoff, and the remaining 64 fell below it.

Approximately two-thirds of this sample included mothers that identified their race as Caucasian only (63%), while the remaining mothers (37%) identified themselves as being a minority race or mixed race. Within this minority subgroup, the majority of mothers identified as African-American only (31%), while two mothers identified as American Indian or Alaskan Native only, and four mothers specified that they were mixed race. A little over half of mothers in the sample had attained at least an undergraduate degree (56%), with many having graduate or professional degrees (25%), while a small percentage had a high school education or less (12%).

Procedures

During participation in the larger study, the mother and child came in to the research lab for a two hour long visit. The mother also completed an online survey composed of several self-report questionnaires either in the one week period prior to coming to the lab visit or at the lab visit. In the current study, data from two mother-child interaction play tasks, clean-up and Tickle-Me-Elmo, and data from the maternal report questionnaires were utilized.

In the clean-up task, mothers were instructed to ask their children to clean up the toys they had played with in a free play session without assistance for five minutes. This task was utilized in order to assess compliance with maternal commands and to elicit mild negative affective reactions in the children (Kochanska & Aksan, 1995). The second observed interaction play task involved the mother and child playing together with a Tickle-Me-Elmo doll for five minutes. The Elmo doll is designed to laugh and shake when he is “tickled” by the mother or

child. This task was designed to elicit positive affective reactions from the mother and child and to observe their conjoint play behavior (Shaw et al., 2006). Mother-child interactions were video-taped and coded using a system adapted from several previous studies (Jabson, Dishion, Gardner, & Burton, 2002; Silk, 2004; Shaw et al., 2006). Video-recordings of the two observational, interactive tasks were coded by trained study staff. Weekly meetings were held to discuss and reach consensus on instances of subtle or ambiguous affect expressions. Coders assessed either mothers or children exclusively in order to eliminate biased scoring. All coders were also blinded to research hypotheses, and the mothers' mental health history and grouping status.

Measures

Maternal emotionality. The Positive and Negative Affect Schedule (PANAS-X; Watson, & Clark, 1994) was included to assess mother's self-reported emotionality. This survey contains 60 questions, and mothers indicated how much they felt a variety of feelings (e.g. interested, scared, nervous) on a 5-point scale from very slightly/not at all to extremely. Overall, these ratings assessed two factors of general positive and negative affect that were shown to be internally reliable (positive $\alpha = .90$, negative $\alpha = .93$).

Maternal depressive symptoms. The Beck Depression Inventory-2nd Edition (BDI-II; Beck, Steer, & Brown, 1996) was used to measure maternal depressive symptoms. The measure contains 21 questions rated on a 4-point scale that assess symptoms associated with depression experienced over the last 2 weeks. An overall score of depressive symptoms was generated from these questions (range 0-63). This scale demonstrated high internal reliability ($\alpha = .94$).

Maternal stress. The Parenting Daily Hassle questionnaire was used to evaluate stress associated with everyday events that parents encounter (PDH; Crnic & Greenberg, 1990), and this was also included in the online survey. The PDH contains 40 questions pertaining to 20

stressful events that mothers may experience when parenting children. Twenty of the questions assessed the frequency with which mothers encounter these events and 20 questions assessed the intensity of how hassled the mother felt when experiencing these events. The frequency and intensity subscales were shown to be reliable (frequency $\alpha = .86$; intensity $\alpha = .94$).

Maternal demographic factors. Mothers also completed a questionnaire assessing demographic characteristics, including questions concerning maternal age (in years), the number of hours that the mother works per week, the number of children living in the household, the mothers' employment status (employed/self-employed, currently unemployed, homemaker, full time student), marital status (married, living with someone, separated/divorced/widowed, never married/single), and whether the mother was the primary caregiver for the target child. Maternal race was categorized as White/Caucasian or minority/mixed race as the majority of mothers either reported being White/Caucasian or Black/African American, with only a few reporting their race as American Indian/Alaskan Native or mixed race. Education was reported by the mothers in terms of grades in school completed or degrees earned and included: less than grade school (1), grade 7-9 (2), grade 10-11 (3), high school diploma/GED (4), some college (5), 2-year degree (6), 4-year degree (7), or graduate degree/graduate professional training (8).

Mother and child observed affect expression. Mothers' and children's expressions of affect were observed in two interactive play tasks (clean-up and Tickle-Me-Elmo). Positive affect was treated as one category, while different types of negative affect expression were coded separately for anger/frustration, sadness, and fear (child only). Affect expression in both mothers and children was recognized based on similar criteria. For each affect, facial and vocal cues were primary indicators, while statements and physical movements were also considered.

Positive affect expression included facial cues, such as smiling; vocal expressions and inflections (e.g. laughing, lilting/raised voice), statements, such as “this is fun”; and behaviors, such as clapping. Expressions of sadness included those that were facial (e.g. frowning, crying) and vocal (e.g. whining, dropping voice), as well as statements (e.g. “I don’t like this”) and behaviors (e.g. slumped shoulders, crossed arms). Examples of anger/frustration expression included facial cues (e.g. drawn brows, tight lips), vocal cues (e.g. yelling, harsh tone), statements (e.g. “No!”, “Do it now!”), and behaviors (e.g. throwing toys). Finally, instances of fear in child included those that were facial, such as wide-eyes, and vocal, such as whimpering, as well as statements (e.g. “Get it away”) and behaviors (e.g. pulling away quickly). This coding method resulted in mother and child variables representing overall duration of time spent expressing each affect. A score representing the percentage of time spent expressing affect was calculated for each category by dividing the duration that either mother or child spent expressing each affect by the total duration of the task that could be coded. For both the mother and child, 30% of the observations were double-coded to assess inter-coder reliability across the two tasks. The child codes included positive affect (kappa = .78), anger/frustration (kappa = .76), sadness (kappa = .74), fear (kappa = .72), and mother included positive affect (kappa = .75).

Maternal expressions of negative affect were very rare and brief; only 15% of mothers expressed any type of negative emotions during either clean-up or Elmo. Thus, variables on maternal negative affect expressions could not be used in the final analysis. Child anger/frustration, sadness, and fear also occurred infrequently (less than 30%). The three types of negative affective expressions were combined into child negative affect expression, which was then dichotomized, with children either expressing or not expressing negative emotions.

Child internalizing and externalizing symptoms. Mothers completed the Child Behavior Checklist (ages 1 ½ to 5) in order to assess a child internalizing and externalizing problems (CBCL; Achenbach & Rescorla, 2001). This survey is composed of 99 questions, and it was included in the online survey. Mothers were asked to rate their children on a variety of behaviors as to whether they were not true, somewhat true, or very true of their child (3-point scale). The CBCL contains factors of internalizing and externalizing behaviors that were both shown to be internally reliable (internalizing $\alpha = .84$; externalizing $\alpha = .90$).

Analytic Strategies

Cluster analysis, an exploratory analytic method, was utilized in order to conduct a person-centered analysis that grouped mothers based on shared features (Clatworthy, Buick, Hankins, Weinman, & Horne, 2005). The maternal characteristics included in defining the cluster profiles were chosen based on their collective established association with child emotional development and socialization. Using SPSS v. 19, the hierarchical agglomerative method was used with Ward's method of determining distance between cluster pairs and confirmation with K-means clustering (Henry et al., 2005). The differences between the maternal profiles based on their defining clustering variables were evaluated using a one-way analysis of variance with post hoc comparisons. Cluster groups were also compared on demographic variables using one-way analyses of variance for continuous demographic variables and chi-square tests for categorical variables.

Finally, child outcomes of interest concerned measures of observed emotion expression, an aspect of emotion regulation, in the presence of the mother, as well as more global measures of child behavioral outcomes as reported by the mother. In order to consider the effects of these variables above and beyond those of possible other maternal characteristics, the significant

maternal demographic variables identified were included as covariates. Child sex was also included as a covariate, as this has often been found to be associated with socialization in children (e.g. Chaplin et al, 2005). Ordinary least squares regression was utilized for the continuous dependent variables (child observed positive affect during clean-up and Elmo, internalizing and externalizing behaviors), and binary logistic regression was applied for the two binary dependent variables (child observed negative affect during clean-up and Elmo).

Results

Preliminary Analyses

Due to their established association with child emotion regulation and development, seven maternal variables were considered when determining grouping in the cluster analysis. These maternal factors were examined for their relation to each other and to the child outcome variables considered (see Table 1). Somewhat surprisingly, it was revealed that observed expressed affect was mostly found to be unrelated to the other self-reported variables. Also unexpectedly, more children expressed negative affect at some point during the Elmo task (n = 48) than during the clean-up task (n = 39), and this may be because some children were initially fearful of Elmo when he would begin to shake. Overall, children tended to show more positive than negative affect during the Elmo task ($t_{(99)} = 9.35$, $p < .001$), but the expression of positive and negative affect during the clean-up task did not significantly differ ($t_{(99)} = -1.13$, $p = .26$).

Maternal Profile Cluster Analyses

The first goal of this study was to determine maternal profiles based on differing levels of characteristics that the mothers shared. The factors considered were maternal emotion expression (observed), positive and negative emotionality (self-reported), depressive symptoms, and stress (frequency of stress events and intensity experienced). The results of this cluster analysis

revealed four groupings characterized by varying levels of the maternal variables considered (Table 2). The four maternal groups were labeled according to their defining characteristics; they are: Happy (n = 32), Intense (n = 12), Flat (n = 34), and Distressed (n = 22).

The Happy group was characterized by high scores on both the observed positive affect and self-reported positive emotionality, low scores on self-reported negative emotionality and depressive symptoms, and average levels for both frequency and intensity of stressful events. The Intense group was distinguished by very high observed positive affect on both tasks; however, these mothers tended to report higher levels of negative emotionality. Despite the Intense group's high expressed positive affect during the interaction tasks, these mothers reported average levels of positive emotionality in general, and slightly elevated levels of depressive symptoms, though they experienced fairly average levels of stress (frequency and intensity). The Flat group tended to show very little positive emotion during the observed interaction tasks and reported low negative emotionality, whereas they reported average levels of positive emotionality. The Flat group also had low levels of depressive symptoms and average frequencies with which they faced stressful events; however, they reported particularly low perceived intensity of experienced stress. Finally, the Distressed group was distinguished by the highest self-reported scores on negative emotionality, depressive symptoms, and stress (both frequency and intensity), while they tended to display less positive observed affect during both interaction tasks and reported the lowest levels of positive emotionality.

More specifically, the post hoc comparisons revealed differences between the maternal profile groupings for each clustering variable. In relation to the measures of observed affect, the Intense group expressed the greatest positive affect during the clean-up and Elmo tasks. However, during the Elmo task, the Happy group also expressed greater positive affect than

either the Flat or Distressed groups. The maternal profiles displayed somewhat different relationships when comparing them on the self-reported measures of emotionality. For positive emotionality, the Distressed group was the only profile that showed differences from the others, with significantly lower levels. Alternatively, the Happy and Flat groups reported significantly lower levels of negative emotionality than both the Distressed and Intense groups.

On the reported measure of frequency of parenting daily hassles, the Distressed group was the only profile that reported significantly higher levels of stress events; whereas, the maternal profiles compared differently with regard to how they perceived these stressful events. The Distressed group again reported the highest levels of intensity of stress experienced, though, the Flat group reported significantly lower levels than all of the other profiles. Finally, concerning depressive symptoms, the Distressed group reported the highest levels. Conversely, the Happy group reported the lowest degree of depressive symptoms, with the Intense group reporting somewhat higher levels in comparison.

Whether the mothers were initially placed in the depressed or nondepressed groups when screened using the CES-D was considered in relation to the maternal profiles and showed significant differences ($\chi^2_{(9)}=23.54$, $p < .001$). As expected, 84.34% of the Happy mothers were initially classified as nondepressed, while the Distressed group was primarily composed of depressed mothers (77.27%). The Intense group contained slightly more nondepressed mothers (58.33%), with the Flat group composed mostly of nondepressed mothers (73.53%).

Demographic Features of Maternal Profiles

The maternal profile groups were also compared based on various maternal demographic features in order to understand these groupings in light of possible contributing contextual factors. These included maternal age, education, race, number of hours worked per week,

number of children living in the household, employment status, marital status, and whether the mother is the primary caregiver for the child. Significant differences were found between the profiles based on maternal education ($F_{(3, 96)} = 4.87$, $p < .01$, $\eta^2 = .13$) and hours worked per week ($F_{(3, 96)} = 2.97$, $p = .05$, $\eta^2 = .09$). The mothers in the Happy group were revealed to have higher education levels than those in the Flat group, while the mothers in the Intense group worked more hours per week than the mothers in the Distressed group. Maternal employment status showed only a marginally significant difference between profiles ($\chi^2_{(9)} = 15.28$, $p = .08$).

Of note, the groups also differed significantly based on race ($\chi^2_{(3)} = 9.21$, $p = .03$). In the sample overall, mothers were described as either White/Caucasian (63.00%) or belonging to a minority/having mixed races (37.00%) so that differences between groups need to be considered within the overall racial distribution of the sample and the different number of mothers within each category. Considering the number of mothers in each racial category separately, the Happy group was composed of slightly more Caucasian mothers (38.10% Caucasian, 21.62% minority/mixed race), the Intense group was fairly evenly split racially (11.11% Caucasian, 13.51% minority/mixed race), and minority or mixed race mothers were more likely to fall into the Flat group (23.81% Caucasian, 51.35% minority/mixed race), while Caucasian mothers were more likely to be classified as Distressed (26.98% Caucasian, 13.51% minority/mixed race).

Child Outcome Analyses

Finally, this study aimed to consider these maternal profiles as they were associated with child emotion regulation as well as more generalized measures of child outcome. The Happy maternal profile was designated as the reference group, as this profile displayed characteristics associated with adaptive child functioning and positive outcomes. Because the profiles differed strongly and significantly based on maternal education and race, these were included as

covariates, along with child sex in order to control for the effects of gender socialization. The results of these analyses are shown in Tables 3 and 4.

With regard to the child observed affect (positive and negative) during the mother-child interaction tasks (clean-up and Elmo), the analyses show mixed results. While the maternal profiles were not significantly associated with positive affect on the clean-up task, maternal race did show a significant relationship. Children of minority or mixed race mothers tended to display more positive affect during this task. Alternatively, maternal profile membership was significantly related to child observed positive affect expression during the Elmo task. Trend associations were found in relation to the Happy group, as the Intense group was associated with more child positive affect and the Distressed group was associated with less (Table 3).

Similar to observed positive affect expressed during the clean-up task, negative affect expressed during this task was also not found to be significantly related to the maternal profiles. However, a significant association was found between the maternal profiles and negative affect expressed during the Elmo task, with the children whose mothers belonged to the Distressed group displaying more negative affect in reference to the Happy group (Table 4).

Finally, the maternal profiles were associated with both child internalizing and externalizing behaviors, while controlling for the covariates. Children whose mothers were classified as Distressed were reported as having more internalizing behaviors than the children of the mothers in the Happy group. Child sex was found to be related to child externalizing behaviors, with males tending to be rated higher on this measure. While controlling for this association, the maternal profiles were also found to be related to externalizing behaviors, and when compared to the Happy group, the children whose mothers were classified as Distressed were reported as showing more externalizing behaviors (Table 3).

Discussion

The first aim of this study was to identify distinct maternal profiles described by characteristics associated with maternal emotion expression and child emotion regulation and socialization. Four maternal groupings were found, labeled Happy, Intense, Flat, and Distressed. As hypothesized, the Happy group was primarily characterized by positive expressed emotion/emotionality and low depressive symptoms and stress, while the Distressed group was characterized by negative emotionality and high depressive symptoms and stress. Also, as anticipated, the Intense and Flat groups were characterized by a mix of positive and negative expressed emotion/emotionality and depressive symptoms and stress. The second aim of this study was to examine these maternal profiles as they were associated with child emotion regulation (positive and negative expressivity) and internalizing and externalizing problem behaviors. It was revealed that the maternal profiles were related to observed affect expression on the Elmo task but not on the clean-up task, partially supporting Hypothesis 2, and illustrating that context is important when considering emotion expression. Finally, the Distressed group, characterized by negative emotionality and depressive symptoms, was associated with child internalizing and externalizing behaviors, confirming Hypothesis 3.

Amongst the four identified maternal profiles, the Happy group was characterized by shared features commonly associated with the lowest risk and most optimal functioning. This included high levels of both observed and self-reported positive affect and emotionality, as higher levels and more common displays of positive maternal emotion are generally associated with more adaptive child emotion regulation (Diamond & Aspinwall, 2003; Garner, 1995). Additionally, the Happy profile was characterized by low levels of self-reported negative emotionality and depressive symptoms, which are also generally considered to be more

beneficial parenting traits and associated with fewer child problem behaviors (Leckman-Westin, Cohen, Stueve, 2009). As opposed to the low risk features associated with the Happy group, the mothers classified as Distressed tended to share characteristics related to high risk parenting practices and poorer child outcomes. These included low levels of both observed and reported positive affect expression and emotionality, and high reported negative emotionality. Thus, it is not surprising that these mothers also reported the highest levels of depression and stress, both of which are associated with negative emotionality (Jacobs et al., 2006).

As expected, the Distressed group of mothers was associated with negative child outcomes in relation to the Happy group. The children of the Distressed mothers were most likely to express negative emotion during the positively charged Elmo task, consistent with findings that children of depressed mothers tend to display more negative emotion (Leckman-Westin et al., 2009). In addition, the children of these mothers were reported as having more internalizing and externalizing problems as compared to the Happy group. Again, this result supports previous findings that children of depressed and stressed mothers tend to display more of these problem behaviors (Goodman, 2007; Anthony et al, 2005), and that low levels of positive emotion may be a mechanism for the transmission of depression (Olino et al., 2011).

It is also significant that the Happy and Distressed mothers' observed and self-report scores on the measures of emotion expression were congruent with each other and with the mothers' scores of depressive symptoms and stress, as depression and stress tend to be associated with higher levels of negative emotions and lower levels of positive emotions (Crnic et al., 2005). Together, these two groups represent the high positive/low negative (Happy) and low positive/high negative (Distressed) mothers that are commonly associated with adaptive and poor child outcomes. However, two additional maternal profiles identified were not characterized by

such clear-cut beneficial and risky maternal characteristics, a trend that has been shown in other recent studies applying a clustering approach (Brophy-Herb et al., 2013; Nelson et al., 2012).

The Intense group was most characterized by high levels of emotion, both positive affect expression and negative emotionality; however, these mothers did not report experiencing high positive emotionality in general. In addition, they reported slightly elevated depressive symptoms. In their study classifying maternal profiles, Brophy-Herb and colleagues (2013) identified a similar cluster, labeled Expressive, and defined by high levels of positive emotional expressiveness within the family and elevated depressive symptoms. In their study, Brophy-Herb and colleagues (2013) assessed positive expressivity within the family setting in particular, and in the current study positive affect was observed in an interaction task with the child, while positive emotionality was assessed in general and across any context. It is possible that these mothers express great amounts of positive emotion to their families and children, while still maintaining negative emotionality and depressive symptoms outside of the family context.

In contrast to the Intense group, the Flat profile was characterized by low levels of observed positive affect and reported negative emotionality, though they reported fairly high positive emotionality. This suggests that these mothers may employ parenting practices associated with inhibited affect when interacting with their children, and Brophy-Herb and colleagues (2013) identified a somewhat similar group of mothers characterized by low positive expressivity, high perceived mastery, and low impulsivity. This group was also defined by encountering stressful parenting events with a similar frequency to the Happy group, but they reported experiencing much less stress due to these events and had low depressive symptoms.

Despite both of these groups being defined by maternal characteristics that are generally associated with poorer child outcomes, including elevated depressive symptoms (Intense) and

less positive emotion expression (Flat), they were not found to differ from the Happy group in relation to child outcomes. This is in line with the sometimes contradictory findings associating parent emotion expression and depression with child outcomes. For example, considering the Intense group, previous findings have highlighted maternal positive emotion expression in supporting adaptive emotion regulation (Diamond & Aspinwall, 2003; Yap, Allen, & Ladouceur, 2008) and in mitigating the risk associated with maternal depression (Olino et al., 2011). However, when maternal depression is not present, the beneficial effects associated with greater parental expressed positive emotion have not always been found (Denham et al., 2000). The maternal profiles identified in the current study inform and elucidate these contradictory findings by characterizing the differing combinations of maternal factors that influence child outcomes.

Two demographic factors were strongly associated with the maternal profiles and included as covariates in the child outcome analyses. While maternal education was related to the maternal profiles, it was not associated with the child outcomes. Maternal race, however, was associated with child observed positive affect during the clean-up task. Cultural differences have generally been found to influence emotion socialization (Friedlmeier, Corapci, & Cole, 2011); however, concerning U.S. samples, studies have generally found inconsistent results (e.g. Cunningham, Kliewer, & Garner, 2009), and this represents an area for further research.

When considering the interactions of the maternal characteristics that define the profiles in relation to the child outcomes, there are several possible explanations for the overall findings. With regard to the Intense group, these mothers may experience more negative emotionality and stress, possibly due to long work hours; however, if they are modeling and engaging in positive emotional exchanges with their child, these children may not experience the risks associated with higher depressive symptoms. Likewise, while the mothers in the Flat group may not express high

levels of observable positive affect with their child, their positive emotionality may more accurately represent contentment, and combined with low levels of stress and depressive symptoms, this may contribute to a relaxed, low-conflict family emotional climate. These, and the poorer child outcomes associated with the Distressed profile, suggest that children may only be at risk to experience ineffective or detrimental emotion socialization when maternal emotion expression and characteristics are consistently negative and co-occur. Thus, when only one characteristic in this process is considered in isolation, the results may be inconsistent.

Limitations

These results need to be considered in light of several limitations to this study, including the relatively small sample and the cross-sectional design. The sample size contributed to the small number of mothers in the Intense group. Additionally, the cross-sectional design limits the ability to draw causal conclusions regarding the maternal profiles and child outcomes. However, the results share similar findings with studies investigating these constructs with related research designs, lending support for their generalizability. Identifying the co-occurrence of maternal and child characteristics is valuable to our understanding of the mother-child relationship.

With regard to the measures utilized, negative observed affect was rare, and perhaps a greater variety of emotion eliciting tasks would result in a wider range of observed negative emotions. Furthermore, the laboratory setting might have influenced how mothers interacted with their children, and data gathered in the home or more naturalistic environments might more accurately represent average maternal interaction patterns. Similarly, while it is a strength of this study that it utilized both observed and reported assessments, only self-report measures were available for some variables, and the study might have benefitted by incorporating different measurement approaches, such as interviews or a wider variety of observational tasks.

Conclusion and Implications

Emotion socialization and the development of emotion regulation are integral components of adaptive child development, and the maternal role in this process is integral. With a greater comprehension of the patterns by which mothers differ and how this impacts child development, interventions and trainings can be adapted to target those at risk. The results of the current study inform clinical practice by providing a more complete and complex understanding of the interconnected maternal characteristics that influence child emotion regulation and development. Characteristics such as depression and stress vary in relation to general emotion, and children may only experience risk when these maternal characteristics are consistently negative and co-occur. This suggests that it may be possible for clinicians to tailor interventions for any one of the identified characteristics in order to alleviate child risk. In all, a more complete conceptualization of the ways in which mothers differ and how these variations children will allow for a better understanding of how to encourage positive, adaptive child development.

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Table 1. Descriptive information and correlations for maternal and child variables

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
1. Maternal positive affect: clean-up													
2. Maternal positive affect: Elmo	.34**												
3. Maternal negative emotionality	-.02	.16											
4. Maternal positive emotionality	.18†	.05	-.50**										
5. Maternal depressive symptoms	-.06	.06	.71**	-.61**									
6. Maternal frequency of parenting daily hassles	-.10	.03	.39**	-.31**	.44**								
7. Maternal intensity of parenting daily hassles	-.03	.13	.46**	.32**	.53**	.74**							
8. Child positive affect: clean-up	.20*	.03	-.14	.24*	-.12	-.01	.04						
9. Child negative affect: clean-up	-.11	-.14	.07	-.05	.18	.08	-.07	-.12					
10. Child positive affect: Elmo	.11	.37**	.03	.02	.06	.06	.02	.22*	-.06				
11. Child negative affect: Elmo	-.03	-.10	.21*	-.11	.23*	.05	.17	.05	.14	-.22*			
12. Child internalizing	-.12	.05	.28**	-.21*	.35**	.49**	.53**	-.05	.06	-.01	.11		
13. Child externalizing	-.14	.14	.30**	-.25*	.44**	.57**	.53**	-.08	.13	.08	.16	.53**	
M	5.20	25.35	15.69	24.78	13.32	22.36	21.23	1.90	--	21.44	--	6.26	10.96
SD	8.62	18.69	7.31	8.09	11.49	8.88	14.03	2.6)	--	15.87	--	5.66	7.56

*p<.05, **p<.01 Note. Means and standard deviations were not reported for the binary child negative affect variables.

Table 2. Means, standard deviations, and statistical comparisons of the maternal clusters and clustering variables

	Happy - H M (SD)	Intense - I M (SD)	Flat - F M (SD)	Distressed - D M (SD)	F df = 3	Partial η^2	Post hoc
Maternal observed positive affect during clean-up task	4.69 (4.22)	18.12 (19.03)	2.39 (2.60)	3.25 (3.33)	15.14***	.32	I > all other profiles; H, F & D do not differ
Maternal observed positive affect during Elmo task	32.27 (8.26)	59.81 (14.60)	11.22 (6.97)	18.32 (15.23)	69.21***	.68	I > all other profiles; H > F & D; F & D do not differ
Self-reported negative emotionality	12.63 (2.67)	18.83 (9.15)	12.47 (3.44)	23.41 (8.95)	20.73***	.39	H & F < I & D; H & F do not differ; I & D do not differ
Self-reported positive emotionality	28.53 (6.80)	24.33 (8.60)	26.24 (7.65)	17.32 (5.13)	11.84***	.27	D < all other profiles; H, I & F do not differ
Depressive symptoms	7.69 (5.09)	14.92 (10.89)	8.68 (7.57)	27.82 (11.27)	30.73***	.49	D > all other profiles; I > H; H & F do not differ
Frequency of parenting daily hassles	19.56 (4.83)	22.17 (8.05)	18.44 (7.49)	32.59 (8.30)	20.80***	.39	D > all other profiles; H, I & F do not differ
Intensity of parenting daily hassles	20.09 (10.05)	25.08 (14.88)	10.65 (5.84)	37.14 (12.35)	31.02***	.49	D > all other profiles; F < all other profiles; H & I do not differ

***p<.001

Table 3. Regression analyses with maternal profile clusters predicting child outcomes

	Child observed positive affect: clean-up task		Child observed positive affect: Elmo task		Internalizing behaviors		Externalizing behaviors	
	β	t	β	t	β	t	β	t
Step 1								
Child sex	-.14	-1.35	.01	.12	-.06	-.61	.21	2.03*
Maternal education	.11	1.08	-.06	-.58	-.17	-1.55	-.04	-.35
Maternal race	-.26	-2.56**	.14	1.36	-.00	-.01	.01	.14
ΔR^2	.09*		.02		.03		.05	
Step 2								
Child sex	-.14	-1.38	.02	.17	-.06	-.61	.18	1.99*
Maternal education	.06	.54	-.15	-1.36	-.17	1.55	-.04	-.37
Maternal race	-.26	-2.45*	.16	1.52	-.00	-.01	-.10	-1.04
Intense	-.02	-.15	.19	1.72	.01	.09	.10	1.04
Flat	-.13	-1.07	-.16	-1.31	-.16	-1.29	-.18	-1.59
Distressed	-.16	-1.42	-.21	-1.81	.33	2.98**	.45	4.44***
ΔR^2	.02		.10*		.17***		.28***	

*p<.05, **p<.01, ***p<.001.

Note. Maternal race is coded as 0 = Minority/mixed race, 1 = White/Caucasian; child sex is coded as 0 = Female, 1 = Male

Table 4. Regression analyses with maternal profile clusters predicting child outcomes

	B	SE	Wald df = 1	OR	χ^2 df = 3
Child observed negative affect during clean-up task					
Step 1					1.75
Child sex	.39	.43	.85	1.48	
Maternal education	-.09	.13	.44	.92	
Maternal race	-.03	.44	.00	.97	
Step 2					7.20
Child sex	.40	.44	.83	1.50	
Maternal education	-.10	.14	.44	.99	
Maternal race	-.11	.47	.05	.90	
Intense	-.80	.87	.85	.45	
Flat	.52	.56	.86	.35	
Distressed	.95	.59	2.57	2.58	
Child observed negative affect during Elmo task					
Step 1					1.47
Child sex	-.04	.42	.01	.96	
Maternal education	-.05	.13	.15	.95	
Maternal race	.52	.44	1.44	1.69	
Step 2					14.83*
Child sex	-.07	.45	.02	.94	
Maternal education	.04	.15	.07	1.04	
Maternal race	.35	.48	.54	1.42	
Intense	.37	.70	.28	1.45	
Flat	.45	.56	.64	1.57	
Distressed	2.50	.69	10.27***	9.02	

*p<.05, ***p<.001

Note. Maternal race is coded as 0 = Minority/mixed race, 1 = White/Caucasian; child sex is coded as 0 = Female, 1 = Male